CLAIMS

5   1.   A de-skew system comprising:

processor configured to receive input data and generate parallel data;

de-skew unit receiving the generated parallel data and a timing signal and adjusting timing of the generated parallel
10   data, based on the timing signal, to generate a plurality of data signals; and

control unit configured to collect portions of the plurality of data signals and to receive a loop data sample and
15   generating the timing signal based on a comparison of the collected portions of the plurality of data signals and the loop data sample.

2.   The system of claim 1 further comprising:

buffer unit receiving the plurality of data and a clock
20   signal and generating a plurality of data signals based on the received clock signal; and

reverse control unit configured to collect portions of the plurality of data signals and to generate a loop data sample
25   based on the collected portions of the plurality of data signals.

3.   The de-skew system of claim 2 further comprising input drivers receiving input data.
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4.   A de-skew method comprising:

receiving a loop back data sample;

determining a data channel specified by the loop back data
35   sample;

determining a delay for data from a specific channel when

the determined data channel is the specific channel; and

5   delaying data from the specific channel by the determined delay.

5.   The method of claim 4 wherein determining a delay comprises:

10   providing data from the specific channel to a delay element; and

comparing data from the delay element with the data from the loop back data sample.

15   6.   The method of claim 5 wherein delaying the specific channel comprises adjusting the delay time of the delay element when the data from the delay element corresponds to the data from the loop back data sample.

20   7.   The method of claim 4 further comprising setting the specific channel at a midpoint.

8.   The method of claim 5 further comprising selecting

25   another channel to supply data to the delay element.

9.   The method of claim 4 further comprising comparing data from the loop back data sample with the delayed data from the specific channel when the determined data channel is the

30   specific channel.

10.   The method of claim 9 further comprising selecting another channel based on the comparison of the data from the

35   loop back data sample with the delayed data.

11. The method of claim 9 further comprising:

5   determining a delay for the specific channel based on the comparison of the data from the loop back data sample with the delayed data; and

adjusting the delay of the specific channel.

12. A method of deskewing parallel data lines comprising:

10   providing parallel data over a plurality of parallel data lines, the parallel data lines providing parallel data from a first unit to a second unit;

successively providing sample data over a sample channel, 15 the sample data corresponding to data of the parallel data, the sample channel providing sample data from the second unit to the first unit; and

using the sample data to align the parallel data.

20   13. A system including deskew functions comprising:

an upstream unit providing parallel data to a downstream unit over parallel data channels;

a downstream unit receiving the parallel data from the upstream unit over the parallel data channels;

25   a sample channel coupling the upstream unit and the downstream unit, the sample channel carrying samples of the parallel data, the sample channel carrying samples of the parallel data from the downstream unit to the upstream unit.

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14. The system including deskew functions of claim 13 wherein the downstream unit includes a sampler for placing samples of data from a selected parallel data line on the sample channel.

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15. The system including deskew functions of claim 14 wherein the upstream unit includes a deskew circuitry for each of the parallel data channels.

16. The system including deskew functions of claim 15 wherein the upstream unit includes control circuitry providing adjustments to the deskew circuitry based on a comparison of portions of the parallel data and data provided over the sample channel.

17. A system of two units coupled by parallel data lines comprising:

a first unit providing parallel data over N parallel data lines;

a second unit receiving the parallel data over the N parallel data lines;

a spare channel in parallel with the N parallel data lines, the first unit providing data of the parallel data lines over the spare channel, the second unit receiving the data of the parallel data lines over the spare channel;

a return channel in parallel with the N parallel data lines, the second unit providing data of the parallel data lines over the return channel, the first unit receiving the data of the parallel data lines over the return channel; and

at least one unit in the first unit deskewing the N parallel data lines using data of the parallel data lines received over the return channel.

18. The system of two units coupled by parallel data lines of claim 17 wherein the second unit includes a selector for replacing data from a selected one of the N parallel data

lines with data from the spare channel.

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